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ANALYSIS OF THE C-17 ACQUISITION:

DID THE AIR FORCE GET THEIR MONEY'S WORTH?

by

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Abstract

Airlift is the cornerstone of all military contingency operations. You can't win the fight if you can't get there. In the late 1970s, the Air Force realized the need to replace aircraft in its current aging fleet. The C-5 and C-141 were already past their prime years and it was time to lobby for a new airlifter. The McDonnell Douglas C-17 was selected as a replacement, but cost overruns and mismanagement plagued the program for years. Stretching the acquisition of the C-17 out over time created critics who believed the program was not worth the money and even questioned the Air Force's need to replace current airlift aircraft with the C-17.

This research study reviews the timeline, performance, and value of the C-17. It identified problems, changes, and improvements in the C-17 program. It also focused on the performance of the jet as compared to the older airlift models it replaced. Findings were conclusive. Delays and cost overruns in the program resulted in the Air Force paying too much for the C-17; however, they received a high performance aircraft that exceeded their expectations.

Part 1

Introduction

The term "*airlift*" is used to describe the utilization of large cargo aircraft to move personnel and/or supplies to an area in need. It is a critical element in U.S. military strategy and the cornerstone of all military contingency operations. As General Ron Fogleman (former Chief of Staff of the United States Air Force) once stated, "Airlift has proved to be the single most important asset to the warfighting equation... We simply can't win the fight if we can't get there."[1] In the late 1970s, the Air Force realized the need to replace airlift aircraft in its current aging fleet as the C-5 and C-141 were already past their prime years. It was definitely time to lobby for a new airlifter. The McDonnell Douglas C-17 was selected as a replacement, but cost overruns and mismanagement plagued the program for years. Stretching the acquisition of the C-17 out over time created critics who believed the program was not worth the money and even questioned the Air Force's need to replace current airlift aircraft with the C-17. This research study reviews the timeline, performance, and value of the C-17. It identifies problems, changes, and improvements in the C-17 program. It also focuses on the performance of the jet as compared to the older airlift models it replaced and addresses the question, ***"What factors caused the delay of the C-17 acquisition...and did the Air Force get their money's worth?"***

Overview

Military airlift remains--without a doubt--the fastest way of transporting manpower and supplies. Despite the end of the Cold War, taskings by the Department of Defense for airlift continue to push the United States Air Force's equipment to the limit. In 1998, for example, the Air Force flew an average of 240 airlift missions *a day* worldwide. They flew cargo and personnel into 150 of 197 countries worldwide, and many of the countries not visited did not have runways with sufficient length to accommodate large aircraft.[2] Thus, the Air Force's cargo fleet has indeed been heavily tasked and relied upon over the years, and today, the fleet's condition reflects this heavy use. Over the last 25 years, the two major types of cargo aircraft used by the United States Air Force airlift fleet are the McDonnell Douglas C-5 Galaxy (average age of fleet: 24 years) and the Boeing C-141 Starlifter (average age of fleet: 32 years).[3]

These aircraft, although capable and versatile, are aging. Twenty years ago the United States Air Force realized this deficiency and lobbied for a new airlift aircraft. The Air Force knew the C-5 and C-141 were lacking due to their age and condition, and believed a new more capable transporter was needed to augment the aging fleet. But what type of aircraft and how many to purchase? ...And at what cost to the taxpayer?

Since 1979, Air Force senior leaders have fought Congress--most notably, the Armed Services Committees--in an effort to convince them to back the purchase of a new and updated transport plane--the McDonnell Douglas C-17. With a unique ability to carry oversized cargo, use shorter airfields, and maneuver on the ground, many felt the McDonnell Douglas C-17 Globemaster III was the next generation transport. However, opponents of the program believed the price tag of the C-17 remained the overwhelming negative factor and many critics felt the added capability did not justify the expense. Some also doubted the increased performance of the high priced C-17 replacement.[4] The areas of cost, performance, quantity needed, and

political disagreements all added up to one key factor--the U.S. Air Force and congressional leaders disagreed on how to use taxpayer money to pursue the Air Force's airlift replacement.

Later, after Congress and the Air Force decided to pursue the development of an updated airlifter, the timetable towards production lagged as the Air Force, Congress, and the contractor (McDonnell Douglas) all conflicted over production, capability, and costs.

This research paper analyzes the recent requirements for airlift by the United States and evaluates the capabilities and performance of past and current military airlift aircraft--to include the C-17. It chronologically examines the scope, parameters, and timeline in which the United States government and the United States Air Force operated under during the acquisition process of the C-17 and determines if waste and/or haste was prevalent during this acquisition, and if so, by whom. Comparing the C-17's performance to that of existing airlift aircraft, it also answers the question as to whether or not the United States Air Force, along with the United States taxpayers, got the "most for their money" with the purchase of the McDonnell Douglas C-17 Globemaster III.

Notes

[1] General Ronald R. Fogleman, chief of staff, US Air Force, address to Altus Air Force Base, Ok., 23 March 1996.

[2] United States Air Force, *Air Mobility Command Master Plan* (Washington, D.C.: U.S. Government Printing Office, 1998), 2.

[3] Ibid, 6.

[4] Major General William Begert, USTRANSCOM J3/4, address to Congress, Washington, D.C., July 1996.

Part 2

In The Beginning

Why the need for a new airlifter? The Air Force's problem of aging airlift runs much deeper than just replacing the C-5 and C-141 with the new and improved C-17. As with any government decision, politics played a key role in the determination process. Delicate political issues coupled with cost, performance, and value clearly made this acquisition complex.

In 1990, the Air Force's position was that even ***ten*** years ago their airlift airplanes were too old to accomplish the types of missions or taskings they had accomplished over the past ***two*** years. Air Force officials argued that airlift jets currently in use were only designed for half of what they had been asked to do.[1] In 1995, General Robert L. Rutherford (former Commander of the Air Force's Air Mobility Command) categorized the airlift maintenance decline as "spreading like a cancer."[2] The Air Force's 1990s answer was an immediate purchase of the McDonnell Douglas C-17 Globemaster III which was initially on the drawing board in 1981.[3]

A year later, in 1996, General Rutherford again stated the Air Force's airlift fleet was continuing to age at an alarming rate. His concern was evident in his testimony to Congress when he said, "The average age of our aircraft far exceeds the average age of our pilots." He added, that as far as the C-5 and C-141s were concerned, "...They are one inspection away from being grounded."[4] In his opinion, 22-year-old pilots should not be flying 32-year-old aircraft into combat situations. He was concerned that old aircraft, flown by young pilots, with an

increased work load requirement could lead to catastrophic safety problems (see Figure 1. on next page). So how big of a problem was the age of the fleet? General Rutherford testified that 75% of the airlift fleet would be 20+ years old by the year 2002.[5] From 1990 to 1996, the Mission Capable Rate (the rate stating the percentage of functioning airlift aircraft that are available for use if needed) had also declined steadily due to overuse with increased contingency, humanitarian, and support operations. Also, due to increased airlift needs and use during DESERT SHIELD/STORM, airlift aircraft Mission Capable Rates declined below 79% during the Gulf War. By comparison, the United States Air Force prefers to maintain Mission Capable Rates at 90% or above (see Figure 2. on next page).[6]

So why was General Rutherford testifying in 1996 about the decline of the nation's transport inventory which began in the 1980s? With upgraded aircraft on the drawing board in the early 1980s, several factors led to poor planning and poor execution in finding and securing a new airlift replacement. The Air Force did need a new airlift replacement in the early 1980s, however, they wouldn't get it...

Political Chaos (1979-1982)

The Air Force began working with several contractors in 1979 to research the options involved in searching for a replacement aircraft to its current cargo workhorses--the C-5 and C-141. Two years later, McDonnell Douglas had the C-17 on the drawing board, and several other aerospace giants had similar proposals in the works.[7] As the political process evolved, many congressional leaders saw this future multi-billion dollar purchase as a possible business and employment opportunity for their own constituents. Many representatives on the Senate and House Armed Services Committees had aerospace industry located in their own states.

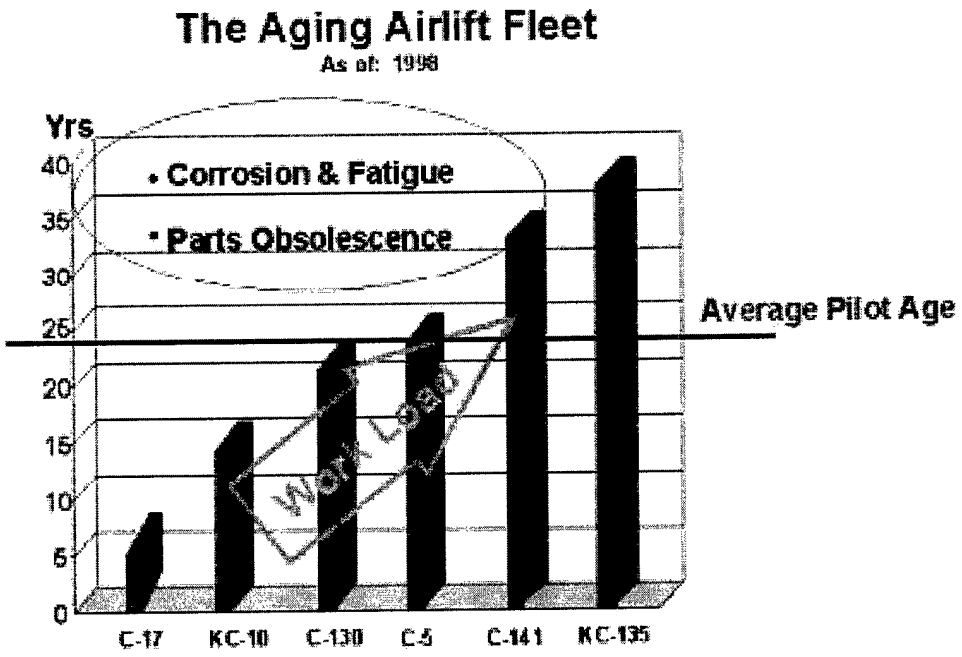


Figure 1 Age of Airlift Aircraft

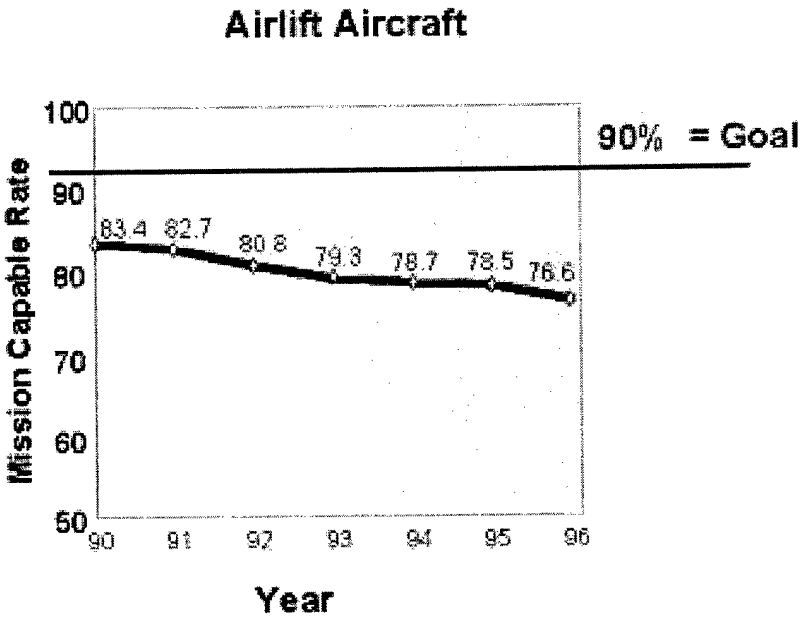


Figure 2 Mission Capable Rates

A congressman from a state with a large McDonnell Douglas, Boeing, or Pratt & Whitney plant in their district suddenly became an ardent supporter of the Air Force's request to acquire a new cargo jet. By contrast, if a congressman had no such incentive to support the acquisition, they became the opposition in what they perceived as an expensive, over priced, unproven, and unnecessary purchase. Their staunch, keen economic "cost saving" strategy was their battle cry, and in most cases, their re-election platform.[8]

This was the political environment in October 1980, when the United States Air Force released a proposal requesting industry to design a new airlifter. In this request, the Air Force did not specify particular aircraft characteristics, but instead, defined several scenarios by which specific combat units had to be moved to representative destinations within certain time constraints. Contractors then developed the aircraft best suited to meet the needs of those scenarios. Lockheed, Boeing, and McDonnell Douglas submitted proposals in January 1981, and a 7-month evaluation period began. In April 1981, the Secretary of the Air Force announced that Lockheed's proposal to modify their current C-5 aircraft would not satisfy the Air Force's requirements, and therefore, they were dropped from competition. Later, in August 1981, the Secretary of the Air Force selected McDonnell Douglas' C-17 design as the winner due to its operational utility features and lower life-cycle cost. Less than a year later, the Secretary of Defense decided to delay the C-17 purchasing plan in favor of a cheaper near-term airlift solution to purchase 50 Lockheed C-5s and 44 McDonnell Douglas KC-10s. It seemed pressure exuded by congressional members anxious to "spread the contractual wealth" won out--thus contributing to putting the C-17 on hold.[9]

The C-17 As An Option (1984-1985)

In February 1984, an Authorization Conference Report, directed by the Senate and House of Representatives Armed Service Committees, ordered the Secretary of Defense to submit a report validating the airlift requirements of the Air Force, as well as the design concepts of the C-17 for the next year's budget submission. The Secretaries of the Army and Air Force, as well as, the Chiefs of Staff of the Army, Air Force, and Commandant of the Marine Corps all signed the report stating the C-17 met or exceeded their requirements for airlift. Secretary of Defense Caspar Weinberger said, as he signed the report, "The design characteristics and performance capabilities incorporated in the C-17 make it the best solution to satisfy overall airlift requirements and meet long range objectives." Soon after, in 1985, McDonnell Douglas began initial prototype development of the C-17 Globemaster III.[10] The race had begun to finally replace the Air Force's aging airlift fleet.

Notes

[1] Air Mobility Command, *The Case for the C-17* (Scott Air Force Base, Ill.: U.S. Government Printing Office, 1990), 2.

[2] General Robert L. Rutherford, commander in chief, USTRANSCOM, address to the President of the United States, Washington, D.C., January 1995.

[3] McDonnell Douglas, *Airlift for the 21st Century* (Long Beach, Ca.: Company Press, 1998).

[4] General Robert L. Rutherford, commander in chief, USTRANSCOM, address to the House Armed Services Committee, Washington, D.C., February 1996.

[5] United States Air Force, *Air Mobility Command Master Plan* (Washington, D.C.: U.S. Government Printing Office, 1998), 8-12.

[6] United States Air Force, *Reaching Globally, Reaching Powerfully: The United States Air Force in the Gulf War* (Washington, D.C.: U.S. Government Printing Office, 1992), 27.

[7] McDonnell Douglas, *Airlift for the 21st Century* (Long Beach, Ca.: Company Press, 1998).

[8] Michael Whicker, *Public Administration Journal* (Rutgers University Press, 1997), 29.

[9] Air Mobility Command, *The Case for the C-17* (Scott Air Force Base, Ill.: U.S. Government Printing Office, 1990), 22-24.

[10] Defense Science Board Task Force, *C-17 Review* (Washington, D.C.: OSD Public Affairs Directorate, 1990), 4-5.

Part 3

Production & Cost

After three years of research and development, McDonnell Douglas received its first contract from the United States Air Force in January 1988 to initially produce two C-17s at a total cost of $603.6 million.[1] This inaugural price tag was high due in part to the massive start-up costs associated with a large acquisition program. McDonnell Douglas advertised that over the years to follow (when larger numbers of jets were due to be purchased) the total overall price would level off and eventually decrease. Initially, in 1985, projected costs per C-17 had been $98 million per jet.[2]

Per Air Force and McDonnell Douglas reports (from 1988-1992), McDonnell Douglas experienced design costs and overruns that far exceeded the initial Air Force contract. In 1988, the Air Force ordered 210 C-17s from McDonnell Douglas, however, as a result of cost overruns, budgetary constraints, and inflation over the following years, the Air Force significantly decreased this order several times.[3] Numerous congressional critics of the C-17 program charged that the cost increases were not a result of needed changes in the program, but that production "foul-ups" had driven up the cost. In December 1989, as the program slowly fell behind schedule and costs rocketed skyward, the Secretary of Defense contemplated reducing the number of C-17s to be purchased from the original order of 210. However, although reducing the number of aircraft acquired would save money, costs per jet rose significantly as the "value

cost" per aircraft decreased.[4] As Major General Michael Butchko (C-17 Program Director) stated in an Air Mobility Command interview in 1990, "These jets are cheaper by the dozen... the less we buy, in essence, the more we will pay per airplane."[5]

Costs Stall The C-17 (1989)

Concerned over cost increases, congressional leaders took action. In May 1989, the Congressional General Accounting Office (GAO) conducted an audit of the C-17 program to examine the price increase. Their findings concluded that McDonnell Douglas had underestimated the weight of the C-17. Due to the increases in the actual weight of the airlifter, the C-17's range had decreased, and as a result, some of the Air Force's requirements and standards were not met. With the C-17 scheduled to make its first flight by August 1990, the GAO noted it would be "a heck of a challenge to make" as they also annotated problems with the jet's computer system and flight controls. Financially, the GAO report revealed that the cost of initial research, development, and engineering had exceeded initial estimates. They estimated cost overruns at over $450 million just two years into the acquisition program. Under its contract, the Air Force agreed to pick up 80% of cost overruns as long as the overall contract did not exceed $6.5 billion (which was the contracted amount for the Air Force's initial order of six jets).[6]

This report raised the opportunistic ears of both congressional supporters and critics alike. Hence, the Air Force began what became an uphill battle. The service was no longer trying to "buy" the C-17, but rather, trying to "sell" it to congressional leaders. Capitol Hill Representatives were trying to appease the taxpayers while they simultaneously worked to assist the military and keep the Air Force airlift arm strong. However, the Air Force felt lawmakers viewed the process not as a defense responsibility--but as a political opportunity. Although this

tactic had always been a part of the military acquisition process, this was the first time in recent history the issue was so aggressively debated.

During the Air Force's aggressive push to obtain the required number of C-17 airlifters, military leaders ran into significant obstacles when presenting their plan to the House Armed Service Committee for approval. Although several of its members were staunch pro-military supporters, many others used the results of the GAO report to politically oppose the C-17 program and pursue their own political agenda. Several fought the C-17 program for the sheer fact that its production had no economic impact on their congressional region.[7]

Hence, the debate over the replacement of the C-5 and C-141 lingered throughout the 1980s and into the early 1990s. As the current airlift fleet continued to age, congressional leaders and Air Force officials adamantly disagreed on the type aircraft needed, the cost of the overall program, and the quantity required. Consequently, the Air Force's decision to decrease the number of C-17s ordered had an adverse effect on the price per jet. The less they purchased--the more expensive they were per copy. As the order went down, the individual price went up.

Purchase Reduction (1990)

Reducing the number of C-17 cargo planes in May of 1990, from 210 to 120 was a huge adjustment to the program. Only two of the Air Force's new jets would be bought in the coming fiscal year, instead of the six originally planned. In protection of the program, the Secretary of Defense stated that the reduction was done, in part, to permit more time for testing the first production models due to be delivered in early 1991. This new plan called for the C-17 production to peak at 24 jets per year in fiscal year 1995. The old plan had production at 29 jets per year by 1994. Overall costs under the new plan were projected at $29.2 billion--down from

$41.8 billion. The Secretary stressed that Congress would have the option of extending the production life and increasing the number ordered should conditions warrant a bigger fleet.[8]

This decision to reduce the number of C-17s from 210 to 120 represented a major reversal in administration policy, which had been, since 1980, to increase airlift capacity. The Secretary of Defense noted that a reduced European threat and smaller overall forces now favored building only enough C-17s to replace worn-out cargo planes and maintain the current transport capacity. Conversely, supporters of the program argued that a reduced Soviet threat actually made the C-17 cargo plane more vital.[9] In 1990, General H.T. Johnson (then Commander of Air Mobility Command) stated, "Although the Warsaw pact appears to be crumbling, the world now has dozens of hot spots. The Soviet Union's armed forces also still remain among the most powerful in the world." He later added that in the 45 years since World War II, Europe had not had a war, yet 90 conflicts had taken place elsewhere costing over 160 million lives.[10]

C-17 Problems (1990-1991)

Even with production slowing, questions about the C-17's range, weight, and computerized cockpit controls continued to haunt the program. By late 1990, the Pentagon, distraught over severe problems to the C-17 program, suspended further payments to McDonnell Douglas. Congressional leaders continued to scramble to take sides as this acquisition program moved to the forefront of Capitol Hill debates.[11] One of the program's staunchest opponents, Representative John D. Dingell, Chairman of the House Energy and Commerce Committee (D-Michigan), openly charged that a "management collapse" at McDonnell Douglas had contributed to an anticipated cost overrun of $836 million. He alleged the plane's problems had pushed its price tag to more than $300 million per copy--an unprecedented cost for a transport aircraft. In a letter to House Armed Services Committee Chairman, Les Aspin (D-Wisconsin), Dingell also

said an internal company report showed a "deteriorating situation" at McDonnell Douglas and an "absolutely appalling picture in labor performance." He added that the company spent an average of 25.8 hours to accomplish assembly work its engineers estimated should take 1 hour. Company and Air Force representatives disputed Dingell's charges, but it was clear the C-17 program had more than just a few critiques beating a small drum.[12]

As concerns and congressional debate over costs grew, the Pentagon sent a team of 50 inspectors to McDonnell Douglas in March 1991 for an intensive two-week review of the company's operations and performance. The Air Force's inquiry was sparked by the Secretary of Defense's recent cancellation of another McDonnell Douglas aircraft contract for the Navy that also suffered from cost overruns and delays. In an effort to avoid the same fate for the C-17, the Air Force attempted to help turn their airlift program around.[13]

Gulf War Impact (1991)

By 1991, as DESERT SHIELD/STORM progressed and results of the war were tallied, to many lawmakers it seemed the war proved the necessity of airlift. Air Force leaders scrambled to ride the patriotic wave of the war, as they viewed this as an opportunity to revitalize the sagging C-17 acquisition program. In his testimony before Congress, General H.T. Johnson believed the Persian Gulf War proved the necessity for buying the upgraded airlift capability he believed the C-17 would supply. He added that if the over-sized C-17 had been operable during the war replacing an equal number of C-141 transporters, airlift capability would have increased by 38 percent. General Johnson argued the Air Force could have moved an additional 12 fighter wings plus an extra 2 infantry brigades in the first 12 days of the war if they had C-17s.[14] Critics still stressed the shortfalls of the program citing the total cost was as much as $3 billion over budget for the life of the contract. Since the Air Force's "fixed cost contract" called for

McDonnell Douglas to absorb any cost overruns over the initial $6.5 billion ceiling, the company would have to incur the $3 billion excess. Congressional critics argued that no company could survive such losses and they feared a government "bail out" would be called for, thus requiring even more funds.[15]

In mid-1991, in an effort to make some decisions over the future of the new airlifter, a series of House and Senate Committee hearings examined reports of the C-17's problems as well as its progress. Legislators were split over the airlifter's future.[16] Not surprising was the level of vigor the legislators from Missouri (headquarters of McDonnell Douglas) verbally supported the program. Representatives from both parties in Missouri stood firm as they led the charge to back the C-17. Said Senator John C. Danforth (R-Missouri), "The C-17 will survive because of the importance of it's mission--replacing the aging fleet of U.S. military transport aircraft."[17] Local Congressman Ike Skelton (D-Missouri) stated he was concerned over delays in the program, but reaffirmed that, "...the C-17 is absolutely necessary, and I hope we don't see it cancelled."[18]

The Air Force was poised and reorganized to resume the airlift acquisition process in late 1991. On the other hand, with the recent DESERT STORM victory, the public perception was that the military demonstrated a decisive win and its weapons had proved effective. The Air Force pushed a position focused on the inadequate and declining cargo aircraft currently in its fleet. However, having just demonstrated the most powerful show of force in recent history, the perception of defense critics was that the military did not need newer equipment. One such critic, Congressman John D. Dingell (D-Michigan) said, "This plane just costs too much. Due to numerous problems and cost overruns, the C-17 program should be cancelled by default."[19] During this time period, the congressional race was actually on to economize and downsize the military force. With a victorious Air Force proving its worth in the desert, the end of the Cold

War, a new focus on battling the deficit, and most importantly--a Presidential election on the horizon--the Air Force's timing to push an expensive program through Congress couldn't have been worse.[20]

Maiden Flight (September 15, 1991)

As congressional leaders squabbled back and forth throughout the following months, the C-17 finally made it's maiden flight on September 15, 1991--one year behind schedule. However, the flight not only provided a huge morale boost for McDonnell Douglas workers, but also gave supporters of the program a reason to celebrate--at least the jet was now flying.[21] However, the celebration was short lived as weeks later the C-17 experienced wing buckling in a series of ground tests resulting in serious cracks to the airframe. McDonnell Douglas investigative teams assigned to determine the problem never found the exact cause, but suggested additional supports inside the wing were needed. This resulted in additional costs and further delays. McDonnell Douglas still defended the financial portfolio of the program and insisted the C-17 would become profitable by 1993, and expected to net $2 billion over the life of the contract. Said a McDonnell Douglas spokesman when asked by congressional officials in reference to the program's financial situation, "We have made an investment in a very significant program for our company and our country. We are in it for the long haul."[22]

Leadership Problems (1993)

In the years following the aircraft's first flight, the C-17 continued to run over budget. Documents obtained from the Air Force's Air Mobility Command showed the program almost two years behind schedule by the end of 1992 and as much as $1.5 billion over budget.[23] By early 1993, Major General Michael Butchko (C-17 Program Director) was fired by the Secretary of Defense (along with two other senior Air Force officers) for mismanagement of the program.

The jets coming off of the assembly line in 1992 and 1993 were also not performing up to the Air Force's standards. Later that same year, Congress held hearings to determine the C-17's fate.[24]

During these 1993 congressional hearings, many were called upon from both sides of the debate to testify before the House and Senate Armed Services Committees. One of the first to testify was McDonnell Douglas Vice President, David O. Swain. His opening statement summed up what his testimony was to be, "The airplane is good--the acquisition process on the part of the Air Force was bad." He later contended that some in his company were not as sensitive to the procedures and regulations initially outlined by the Air Force when building the C-17. He further added that a major problem for McDonnell Douglas was that people working on the project were accustomed to conducting commercial rather than government business.[25]

During this congressional testimony, one witness warned legislators that the C-17 program was about to "stall out". Retired Air Force Colonel Ken Tollefson oversaw production of the aircraft for the Department of Defense. His testimony was somewhat more detrimental and condemning of the contractor. He blamed two factors for the cost overruns and schedule lapses in the program. First, Colonel Tollefson pointed to rapid growth in employment at the McDonnell Douglas plant from 15,000 workers in 1984 to 50,000 in 1990. Second, he highlighted the company's 1989 reorganization that he felt stressed interpersonal skills at the expense of technical ability. In support of Colonel Tollefson's assessments were members from the GAO who in 1989 conducted an investigation of their own. They testified the C-17 program was plagued by so many problems--technical and financial--that further spending on it should be suspended until they were resolved. Louis Rodrigues, Director of Systems Development and Production for the GAO, added that he was concerned about the "affordability of the C-17" and

whether proper consideration had been given to alternatives that could offer adequate airlift capability at less cost to the taxpayer.[26]

The GAO testimony buttressed that of acting Pentagon Inspector General, Derek Vander Schaaf, who urged the committee to put the C-17 on hold until it accomplished a complete review. He added there were similarities between the failed McDonnell Douglas Navy A-12 program just years before and the current C-17. The Congressional Budget Office echoed this sentiment suggesting it might be cheaper to shut down the C-17 production line and resume the production of the C-5 instead. Built at a cost of $200 million each, the C-5 looked inviting. They added that because the C-5's cargo capacity was 40% greater than that of the C-17, only 70 C-5s would be needed to match the capacity of 100 C-17s. Savings using this logic would total over $11 billion over the life of the contract.[27]

However, supporters of the C-17 fiercely defended the program. Remarking that the defense program had the strong backing of both the President and Secretary of Defense who both called increased cargo capacity critical to the rapid deployment of U.S. forces around the world. McDonnell Douglas and Air Force leaders said the harsh criticism was unwarranted and the alternatives were impractical and out of date. General Ron Fogleman (then Commander of Air Mobility Command) outlined the vast differences between the C-17, C-5, and C-141. He praised the unique capabilities of the C-17 and added that recent tests had proven the C-17 was making remarkable progress.[28]

Congressional testimony during these hearings showed a bipartisan split for the C-17 program as both sides had solid and valid concerns. However, the ghosts of failures past haunted McDonnell Douglas and the Air Force's C-17 cargo plane during these hearings. The final nail in the coffin was a Pentagon report released during the weeks of the congressional hearings. The

report outlined the results of over 50 hours of flight tests on the jet and cataloged numerous deficiencies with the airlifter. The Pentagon report outlined several problems concerning severe vibration on landings, reduced range, and defective computer software. In addition, it was discovered that the last jet delivered to the Air Force had 56 pages of missing items and waivers to contract specifications.[29]

This report, required by Congress, was completed at the worst possible time for defenders of the C-17 program. The damaging Pentagon report, continued setbacks, mismanagement of the program, and troubles with previously delivered jets spelled disaster as Congress voted on the C-17's future.

Following the congressional hearings in 1993, the Pentagon was forced again to cut the number of C-17s to be purchased. Just three years earlier, they had cut the number from 210 to 120, now they reduced the number to 40 until further assessments could be made on the aircraft's condition. This vast reduction in number once again drove up the cost per copy. McDonnell Douglas documents show that following the reduction, cost projections per jet placed it well above $350 million each.[30]

"Airlift Is Broken" (1994)

In the post-DESERT STORM era, there was a push to downsize the military. Lawmakers found themselves analyzing every new acquisition project as well as carefully looking at current equipment. Congress and the American public seemed to view the military as too large already, and unnecessary in this time of peace.[31] However, in 1994, Marine Corps four-star, General Joseph Hoar (then Commander-in-Chief, US Central Command) was called to testify before the House Armed Services Committee to discuss the status of the military as he saw it. Concerning the issue of airlift, General Hoar's comments rocked congressional leaders back on their heels.

"Airlift in this country is broken right now," commented the General. "I'm not sure with all the downsizing and cutbacks thus far, we could support one major regional contingency operation." He continued to say that airlift in 1994 depended on a fleet of old C-5 and C-141 aircraft which required long runways to operate. Added General Hoar, "A new C-17 cargo plane--designed to carry tanks and heavy artillery into war zones served by small airstrips--is critical to the success of the military mission."[32]

Regardless of the design and acquisition troubles of the C-17, by mid-1994, it was well recognized by Congress, defense leaders, and the military that the C-17 was crucial to sustaining airlift capability. New studies had surfaced by the Air Force and the GAO that outlined serious aging problems with the current airlift fleet of C-5s and C-141s. The Air Force currently had over 240 C-141 transports that were over 30 years old, and due to the increased capacity of the C-17, 120 Globemasters could replace the airlift capability of those 240 C-141s.[33] Talk now resumed of increasing the number of C-17s to be purchased from 40 back to 120. Many still toyed with the notion of buying a mix of newer and cheaper C-5s and C-141s instead of the costly C-17. However, due in large part to its increased capability, ability to operate on small airfields, and superior maneuverability, the C-17 was still the clear winner regardless of price.[34]

The C-17 Turns the Corner (1995)

If 1993 was the year the C-17 started to die, 1995 was the year of its partial resurrection. Early that year, Congress decided to clean McDonnell Douglas' slate and pay them a partial settlement to keep production of the C-17 moving. This allowed the company to recover some of its losses and keep the assembly lines rolling. The contractor also dropped legal claims against the Air Force under this settlement. Said General Ron Fogleman, "As a result of this agreement, we are now able to get out of this fractious relationship with the contractor. Also,

since the settlement, the last seven airplanes have been delivered early and quality has been improving."[35]

As quality control increased and delivered C-17s performed to a higher standard, the President, Secretary of Defense, congressional leaders, and Air Force leadership all began to converge on the C-17 as backers. Data from DESERT STORM, and a new push to ensure the military could fight a two front war, added to the perception that airlift was crucial to any military operation. Said Secretary of Defense William Perry, "The bulk of the forces we will need to defeat any major aggressor will be based in the United States. We need airlift--and a lot of it...airlift that can land anywhere. This is the key reason we are committed to the C-17."[36] For the first time ever, the Secretary of Defense had been openly enthusiastic about the C-17; a plane that had previous budgetary, production, and deadline problems. The Secretary also seemed more agreeable to purchase more than the reduced number of 40.

By all accounts, the C-17 had made a turn-around. In May 1995, McDonnell Douglas, a firm that had struggled with quality production problems for the last few years, won the Collier Award. As the most prestigious award for aeronautic excellence, the Collier Award gave all involved a reason to be proud.[37] The C-17 had indeed come full circle, as the program weathered multiple technical problems, cost increases, a drumbeat of congressional criticism, and horrendous company mismanagement. However, at a cost of still over $300 million each, the airlifter still had its critics.[38] In the summer of 1995, the Air Force put the C-17s it had through another set of rigorous tests for 30 days. During this testing period, the jets flew missions to a Royal Air Force base in England and to various points in the United States. It participated in air refueling and airdrops as well as taking off from austere airfields. By all

accounts, those tests exceeded expectations as the C-17 registered a reliability rate of 99.2 percent.[39]

In November 1995, after a long and turbulent flight, the C-17 made a smooth landing as the Defense Department decided to purchase another 80 jets--bringing the total number up from 40 back to 120. Due to program improvements, leadership fixes, and more importantly, the increase in number purchased, the cost per copy now dropped from over $300 million to under $225 million. Congressional leaders from Washington state (home to Boeing) had lobbied hard for the Air Force to purchase less C-17s and more Boeing C-141s, however, in a last minute push by Missouri's congressional delegation (the home to McDonnell Douglas), the C-17 won out.[40]

Notes

[1] A. Goodman, "Douglas Gets C-17 Production Order," *St. Louis Post Dispatch*, 21 January 1988.

[2] A. Goodman, "McDonnell Douglas Hit By $48 Million Loss," *St. Louis Post Dispatch*, 20 July 1989.

[3] General Accounting Office (GAO), *C-17 RM & AE Report*, (Washington, D.C., 1996).

[4] J. Carroll, "C-17 Plane May Be Cut By Cheney," *Los Angeles Times*, 9 April 1989.

[5] A Goodman, "Air Force Tells McDonnell Douglas To Correct Procedures," *St. Louis Post Dispatch*, 8 June 1990.

[6] Defense Science Board Task Force, *C-17 Review* (Washington, D.C.: OSD Public Affairs Directorate, 1990), 18-20.

[7] Ibid, 31-32.

[8] A. Goodman, "Air Force Tells McDonnell Douglas To Correct Procedures," *St. Louis Post Dispatch*, 8 June 1990.

[9] Ibid.

[10] Robert Goodrich, "General Touts C-17's Abilities, Says Shrinking Soviet Threat Will Make Plane More Vital," *St. Louis Post Dispatch*, 12 April 1990.

[11] Defense Science Board Task Force, *C-17 Review* (Washington, D.C.: OSD Public Affairs Directorate, 1990), 17.

[12] J. Carroll, "Tool Flaws Raise C-17 Doubts--Concern Grows About Costs," *Los Angeles Times*, 9 February 1990.

[13] A. Goodman, "Pentagon To Inspect McDonnell Douglas," *St. Louis Post Dispatch*, 8 March 1991.

[14] United States Air Force, *Reaching Globally, Reaching Powerfully: The United States Air Force in the Gulf War* (Washington, D.C.: U.S. Government Printing Office, 1992), 29-30.

[15] Jim Gallagher, "McDonnell Douglas May Take Hit on C-17," *St. Louis Post Dispatch*, 20 August 1993.

Notes

[16] A. Goodman, "Takeoff: C-17 Has Initial Flight Today," *St. Louis Post Dispatch*, 14 September 1991.

[17] Jim Gallagher, "McDonnell Douglas May Take Hit on C-17," *St. Louis Post Dispatch*, 20 August 1993.

[18] J. Carroll, "Tool Flaws Raise C-17 Doubts--Concern Grows About Costs," *Los Angeles Times*, 9 February 1990.

[19] Jim Gallagher, "McDonnell Douglas May Take Hit on C-17," *St. Louis Post Dispatch*, 20 August 1993.

[20] Francis Thompson, *Reinventing The Pentagon: The Political Economy of Post Cold-War Defense* (Public Administration Review, 1993), 571.

[21] A. Goodman, "Takeoff: C-17 Has Initial Flight Today," *St. Louis Post Dispatch*, 14 September 1991.

[22] Robert L. Koening, "McDonnell C-17 Called Unsafe," *St. Louis Post Dispatch*, 15 November 1991.

[23] Air Mobility Command, *C-17 Reliability, Maintainability, and Availability Evaluation* (Scott Air Force Base, Ill.: U.S. Government Printing Office, 1990), 16.

[24] Jon Sawyer, "Aspin Fires General Over C-17," *St. Louis Post Dispatch*, 1 May 1993.

[25] A. Goodman, "Pentagon Rips Air Force Over Cargo Plane," *St. Louis Post Dispatch*, 30 November 1993.

[26] Ibid.

[27] A. Goodman, "Military Weakness Foreseen. Congress Told of Lack of Airlift Capability," *St. Louis Post Dispatch*, 30 March 1994.

[28] Gary Anderson, "GAO Auditors Find Numerous Glitches in C-17 Cargo Plane," *St. Louis Post Dispatch*, 13 October 1994.

[29] Wright-Patterson Air Force Base, *C-17 Combined Test Force: Reliability and Maintainability Test Results* (U.S. Government Printing Office, 1994), 2.

[30] Jon Sawyer, "Study Says The Air Force Should Stop Buying C-17s," *St. Louis Post Dispatch*, 11 December 1994.

[31] Jim Gallagher, "McDonnell Douglas May Take Hit on C-17," *St. Louis Post Dispatch*, 20 August 1993.

[32] "The Air Force and Joint Vision," *Joint Force Quarterly*, 1994 Winter Addition, 24-29.

[33] Wright-Patterson Air Force Base, *C-17 Combined Test Force: Reliability and Maintainability Test Results* (U.S. Government Printing Office, 1994), 28-29.

[34] A. Goodman, "Globemaster Makes Its Overseas Debut," *St. Louis Post Dispatch*, 15 October 1994.

[35] William Flannery, "Air Force High On C-17," *Reuters News Service*, 5 March 1995.

[36] Ibid.

[37] Jon Sawyer, "McDonnell Douglas Wins Collier Award for C-17," *St. Louis Post Dispatch*, 14 May 1995.

[38] Robert Goodrich, "C-17 Begins 30 Days of Testing," *St. Louis Post Dispatch*, 10 July 1995.

[39] Christopher Carey, "C-17 Passes Make Or Break Test. McDonnell Douglas Jet Scores 99.2%," *St. Louis Post Dispatch*, 6 August 1995.

Notes

[40] Christopher Carey, "McDonnell Douglas Lands $18 Billion Deal," *St. Louis Post Dispatch*, 4 November 1995.

Part 4

Worth The Money?

The C-17 program eventually survived, however, the Air Force and McDonnell Douglas had undergone a host of conflicts and changes over the years. Ultimately, problems were corrected and 120 aircraft were purchased. One major issue is the value of the aircraft purchased--not only in the monetary sense--but also the *performance* value. Did the C-17 live up to the expectations? Did the C-17 outperform the older airlifters it replaced?

The C-17 is indeed being used at a high rate. However, one significant issue raised among C-17 critics is reliability and maintainability. During the height of C-17 controversy in the early 1990s, the Air Force conducted numerous tests on the airlifter (described earlier). These studies were instrumental in identifying problems within the program, and in some cases, to strengthen the position of the airlifter's supporters. The latest data from the Air Force and McDonnell Douglas reveal comparisons in critical areas between the C-5, C-141, and the C-17.

Maintenance & Flying Costs

One area the Air Force emphasizes is the durability and "value" they are getting out of their jets. This metric is identified as "Maintenance Hours Per Flight." These figures show how many hours a maintenance crew has to work on the jet in relation to every hour the jet is in the air. In the case of the C-5, the aircraft requires an average of 40 hours maintenance time for every hour the jet is airborne--a high figure by comparison to other airlift jets. Although the C-141

requires less maintenance than the C-5, the C-141 still requires an average of 15 hours of maintenance per flight. Conversely, the C-17 is now down to only 5 hours of maintenance per flying hour (see Figure 3. on next page). As General Hogle (Vice Commander, Air Mobility Command) said in a recent presentation at the Pentagon to a group of new Air Force General Officers, "The C-5's problem is reliability--not capability. When the C-5 flies, it is a very capable aircraft. We just need it to be flying more than it is."[1]

Despite the critics, it is evident from a maintenance aspect that the C-17 requires less hours of care as compared to the C-5 and C-141. Although in prior years these figures were not as complimentary to the C-17, the improvements in the acquisition program and in the quality of the product is reflected in the latest figures. When comparing the least amount of maintenance hours per flight, the C-17 is the #1 performing aircraft in Air Mobility Command. Also, as displayed in the attached graphs, when less maintenance work is needed on an aircraft the costs per flying hour are reduced (see Figure 4. on next page).

Over the production years, many critics protested that the C-17's price tag had gone through the ceiling. However, much of the cost increases were due to the reduction in numbers ordered, thus spreading costs out over fewer jets. As the decision was later made to purchase an increased number of aircraft (and as production was streamlined) costs were reduced.[2]

As Air Force figures demonstrate, the maintenance and purchase costs are clearly headed in the right direction--but what about performance? What are the C-17's capabilities in relation to the C-5 and C-141? Is it more capable and worth the cost? Through the analysis of the evidence and data compiled, the C-17 is definitely meeting the expectations and objectives of Air Mobility Command.

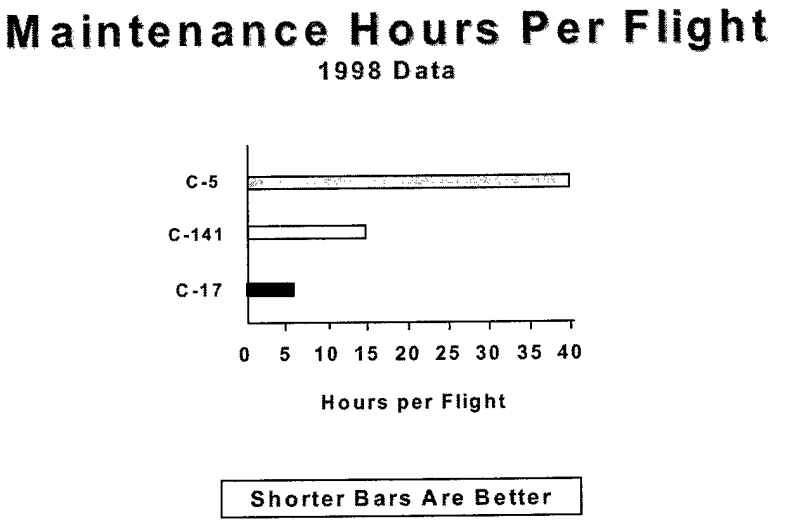


Figure 3 Maintenance Hours Per Flight

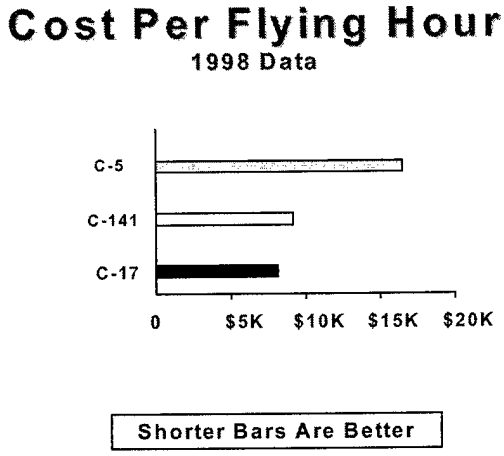


Figure 4 Cost Per Flying Hour

Cargo Capacity & Landing Advantages

Two areas the C-17 easily exceeds the capabilities over all other airlift aircraft is the C-17's efficient cargo carrying capability as well as the ability to land on shorter austere airfields. With most of the recent contingency operations taking place in third world countries with shorter and less developed runways, the larger and heavier C-5 and C-141 jets are unable to utilize those airstrips regardless of how much cargo they can carry. The C-17, however, can transport large amounts of cargo and deliver it to runways previously unreachable by the C-5 or C-141 (see Figure 5. & Figure 6. on following pages). Previously, only the much smaller cargo carrying C-130 could support such a location. Supporters of the C-17 laud its abilities in these areas.[3]

The C-17 not only has the ability to land on shorter runways, but it is also much more maneuverable than the C-5 and C-141. With a tighter turning radius and the ability to taxi in reverse (no other airlift aircraft in the U.S. fleet has this ability), the Air Force is able to land and park more C-17s on a ramp than C-5s or C-141s. This capability allows the Air Force to deliver more cargo to more places--and do it more efficiently (see Figure 7. on following pages).

So what does this type of capability net the Air Force in the long run? The facts demonstrate the C-17's impressive cargo capability. With superior maneuverability over that of the C-5 and C-141, the C-17 can park almost twice as much cargo on an average 500,000 square foot ramp (see Figure 8. on following pages). As mentioned previously, the C-17 can also deliver this cargo to many airfields the C-5 does not have the capability to access.[4]

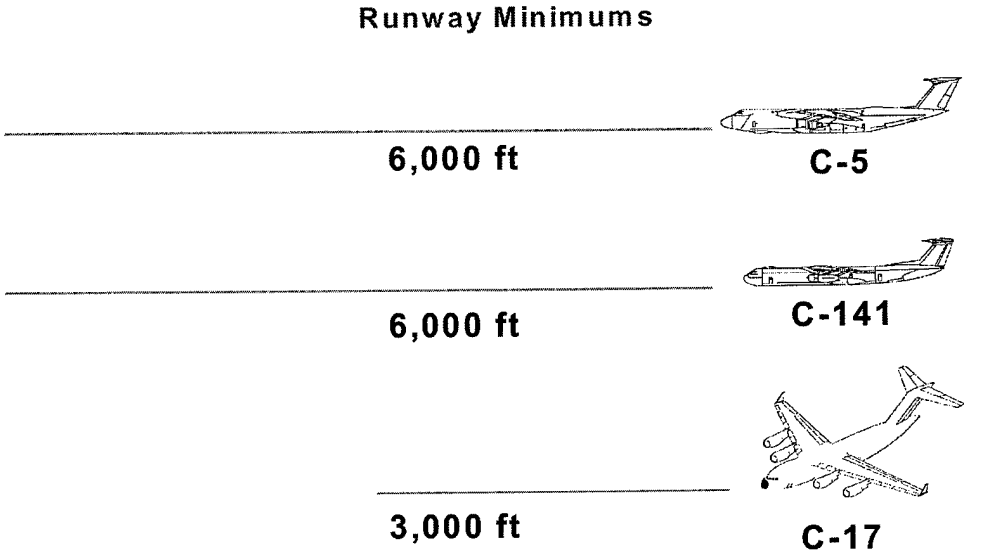
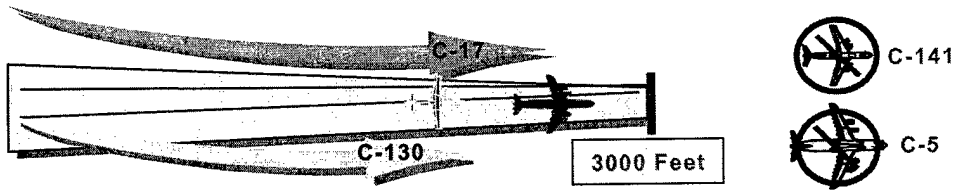


Figure 5 Runway Minimums



- **C-17 Lands At C-130 Size Airfields, But Carries Four Times The Cargo Weight... The C-5 & C-141 Can Not Land At Airfields This Short.**

Figure 6 Minimum Landing Distance

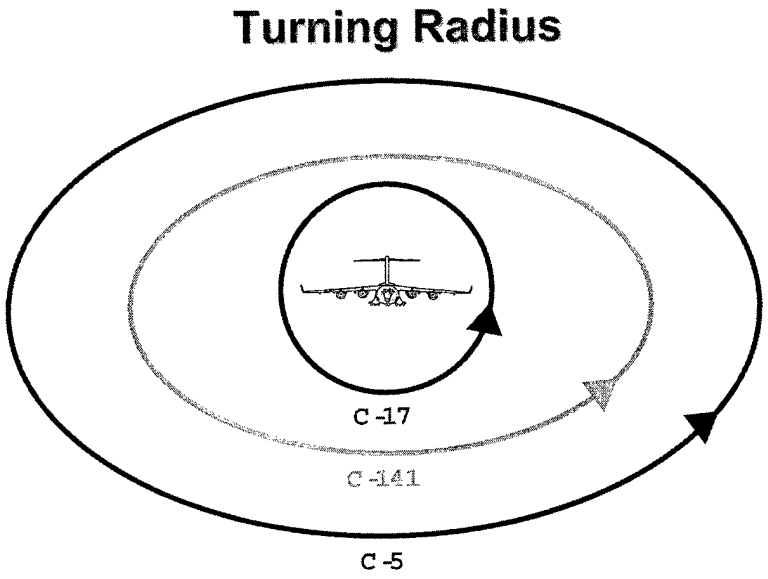


Figure 7 Turning Radius

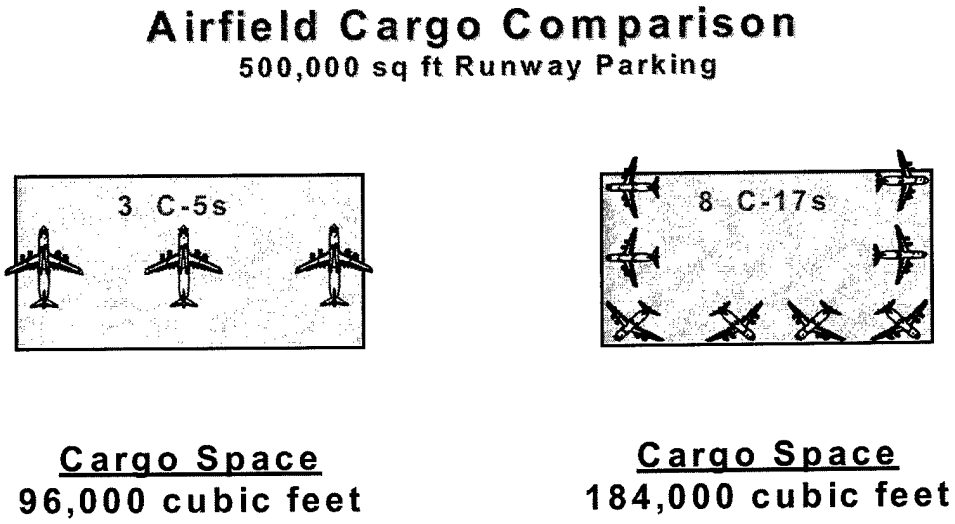


Figure 8 Airfield Cargo Comparison

Delivery Rate Improvements

Critics of the C-17 continue to site the pace at which the aircraft came off of the assembly line. This research paper clearly documents an almost 15 year history of cost overruns and delays due to political pressures, poor program leadership, and design problems. However, in recent years, the C-17 has made steady progress. These advancements can also be seen in the delivery rates of the aircraft to the Air Force. In September of 1991, the C-17 made its maiden voyage; however, it was still delivered one year behind schedule. Since then, McDonnell Douglas has made steady progress and has delivered the jets at a much faster pace. Documented over time, the first 15 aircraft off of the line were delivered behind schedule, but by 1994 (following the decrease in jets ordered from 120 to 40, and after several oversight inspections) the C-17s were rolling off of assembly lines ahead of schedule (see Figure 9. on next page).[5]

The data has not only shown the increased performance by McDonnell Douglas in the home stretch, it also cataloged an impressive performance by the C-17 itself. Compared to the C-5 and C-141, it is statistically superior in many areas. The C-17 meets or exceeds all of the parameters set by the Air Force early on in the program. As a more efficiently maintained jet, operating at lower costs, with the ability to land on shorter airfields, and collectively deliver more cargo--the C-17 is clearly the long awaited improvement over the C-5 and C-141.

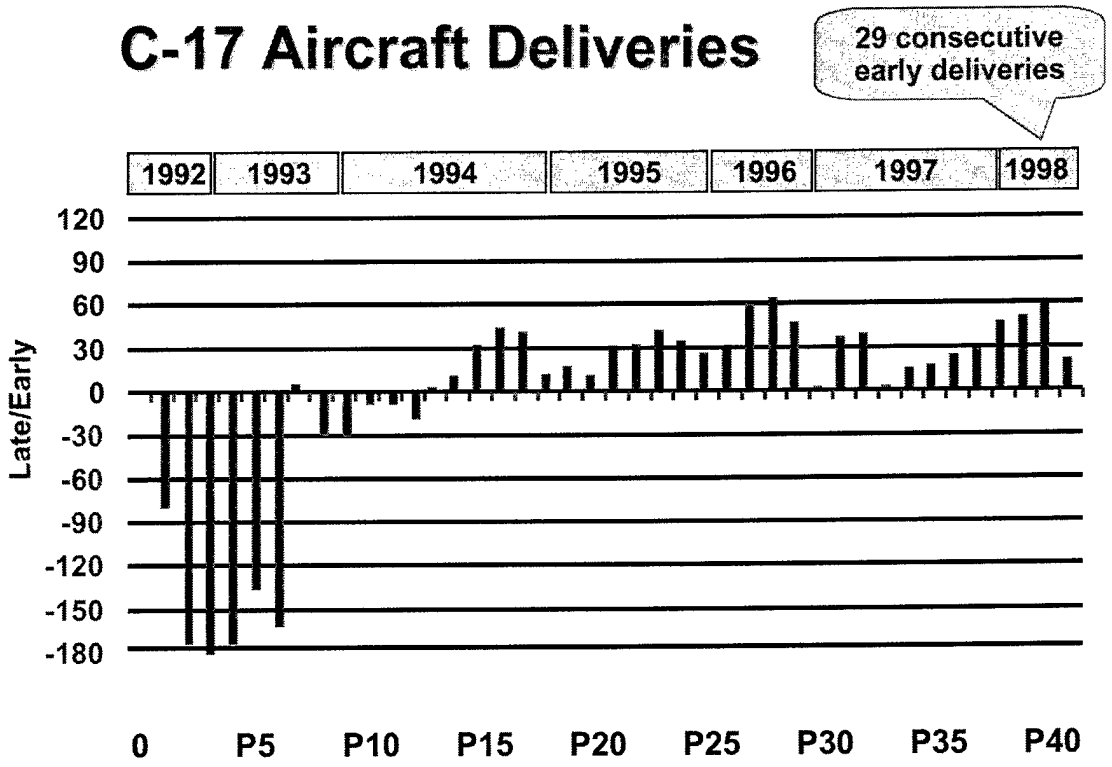


Figure 9 C-17 Aircraft Deliveries

Notes

[1] General Walter Hogle, director of plans and programs, Air Mobility Command, address to Air Force senior leaders, Washington, D.C., July 1998.

[2] Darlene Druyun, principal deputy assistant secretary, acquisition and management, officer of the Secretary of the Air Force, address to Air Force senior leaders, Washington, D.C., 1996.

[3] General Accounting Office (GAO), *C-17 RM & AE Report*, (Washington, D.C., 1996).

[4] Ibid.

[5] General Walter Hogle, director of plans and programs, Air Mobility Command, address to Air Force senior leaders, Washington, D.C., July 1998.

Part 5

Summary

Over the past 10 years, the entire military force has undergone much change and downsizing. Gone are the President Reagan years of massive build-up and acquisition. Although the C-17 was poised for production in the mid-1980s, political bureaucracy raised its ugly head and infected the process. Politics have always been a part of the military's acquisition process, and with the approval of the President, Congress has delegated the decision-making authority to independent bi-partisan committees. In the case of the military, those are the Senate and House Armed Services Committees.[1] Their role is to hear the needs of the services--in this case the Air Force's request to acquire the C-17 as a replacement to the C-5 and C-141--and determine the viability of that need. Political maneuvering and the bureaucratic process have always existed in this equation, however, the Air Force's battle over the C-17 took this debate to an unprecedented level.

Many discrepancies have entered into this scenario between the government and the flying arm of the military--Air Mobility Command. Congressional leaders have a loyalty to spend taxpayer dollars wisely, but the military has a loyalty and a mission to keep it's defenses and fleet strong. The Air Force believed it was fighting to beat the clock that was ticking away against its aging airlift fleet, but concurrently, they also felt that conflicts of interest,

congressional meandering, and the inadequacies of the contractor were working against that effort.

In Congress' defense, the Air Force had not taken on such a large contractual need in many years, and Air Force senior leadership was ill prepared for the fight and debate confronting them on Capitol Hill. Having prospered in the Reagan years, the Air Force perceived the C-17 purchase as a "given", and when confronted with an indifferent politically motivated opposition, the Air Force quickly found itself in a downward tailspin. The Air Force made mistakes in their organization, cooperation, and, "salesmanship" of the C-17 program. Many concur with the former Secretary of the Air Force when she commented to a group of aerospace engineers that the initial C-17 planning team lacked quality management, business, and organizational skills.[2] She made this statement because the Air Force team who attempted to convince Congress in the 1980s to back the purchase of the C-17 lacked the ability to bring the entire project together. In actuality, they isolated themselves from those who could have helped them the most--their own personnel, supporters on Capitol Hill, and their allies in the aerospace industry. Air Force senior leaders were so adamant to acquire the McDonnell Douglas C-17, they did not take the steps necessary to ensure they could "sell" this plan to Congress for approval. The C-17 acquisition issue was also far too complex to be dealt with by only a few select Air Force generals who thought a quick pitch to Congress in the 1980s would secure a multi-billion dollar program.

In the early 1980s, the military's approach was strictly one-sided. The Air Force had half heartily prepared themselves when presenting the facts to the House and Senate Armed Services Committees, and they virtually snuffed out the competitive process in civilian industry by focusing solely on one company.

To analyze how and why the Air Force turned the program around, one has to compare their 1980s strategy, or lack of it, to that of the 1990s. Not only did the military restructure their involvement and interaction with industry, they also restructured their approach towards the problem. In the 1980s, Air Force senior leaders found it difficult to defend their position of needing 210 C-17s. Armed with numbers and budgetary figures, the Air Force faired poorly on Capitol Hill when representatives set their sites on this complex and expensive program. Even those congressmen with reason to support the program, due to home state industry advantages, were of little consequence to the majority who fought to stake a claim in the 1990s war of economizing and downsizing.

After years of unsuccessful bargaining on Capitol Hill, the Air Force realized they needed a different approach. A main flaw in the Air Force's earlier strategy was focusing on the solution instead of the problem. Not taking into account the "environment" they were now in, the Air Force wasted valuable time in getting the C-17 program off of the ground. Many felt the Air Force wanted the McDonnell Douglas C-17 at all costs. Their approach to Congress had not been that their current fleet was aging and they needed to find a quality replacement, but rather, that they needed the C-17--and only the C-17.

Later, armed with updated DESERT STORM data and testimony from combat pilots, the Air Force had a blue print of the type of jet it needed. Initially, the complexities of replacing the C-5 and C-141 made it difficult for the Air Force to convince congressional leaders they were on the right track, and that the C-17 was the correct choice. Believing the current air mobility fleet was already past its prime, the Air Force restructured its senior leadership and assembled a new team of experts to re-engage the fight. Several Air Force general officers were forced to retire as the Air Force realized part of the ineffectiveness in their earlier attempts to promote the program

was poor leadership.[3] Instead of the Air Force "pushing" the program forward, they reassessed their leadership, their situation, and their objective. The Air Force also aggressively pursued several key congressional allies. What was the Air Force's new strategy? To effectively present a current evaluation of the airlift fleet, the problems faced, and the requested number need.

Meanwhile, McDonnell Douglas reworked their approach as the Air Force and industry worked collectively to save an almost defunct program. When the Air Force re-engaged Congress on the airlift issue, they were not a lone entity pushing an expensive program. They were however, armed with statistics, testimony, and pertinent facts outlining a true assessment of their current fleet. They also had industry working together towards a common goal--the implementation of a new and more sophisticated cargo jet.

Notes

[1] Ronald Arnold, *Congress and the Bureaucracy--A Theory of Influence* (New Haven: Yale University Press, 1979). 30-31.

[2] Sheila Widnall, secretary of the Air Force, address to McDonnell Douglas engineers, Long Beach, Ca., 28 October 1994.

[3] General Robert L. Rutherford, commander in chief, USTRANSCOM, address to the President of the United States, Washington, D.C., January 1995.

Part 6

Conclusion

After a through review of the program, its failings, and statistical data, the C-17 is clearly a superior airlifter acquired through an inferior acquisition environment. After close review of the performance data, the aircraft is definitely an outstanding upgraded follow-on to the C-5 and C-141. Its cargo capabilities, short airfield abilities, and overall performance make it an *exceptional* replacement (see Figure 10. & Figure 11. on next page). Even early critics of the C-17 do not dispute the recent evidence of the program's turnaround and of the C-17's recent performances.

It is tough to question America's need for the C-17. The Air Force's existing fleet of airlifters plays a key role in military operations. As the United States scales down the size of it's military forces and significantly reduces overseas deployments--the need for rapid air mobility increases. The current fleet of C-5 and C-141 has drawn close to the end of its useful life and aged even further during DESERT SHIELD/STORM. With roughly the same external dimensions as the C-141, the C-17 carries a bigger payload more efficiently.

Administratively, the debate over the C-17 program and the consequent reorganization of how the military conducts acquisition affairs was one of the causes for the Department of Defense (DoD) to recently rethink its business philosophy. In a recent report to the President, William Cohen (the current Secretary of Defense) reaffirmed that the recent downsizing of the

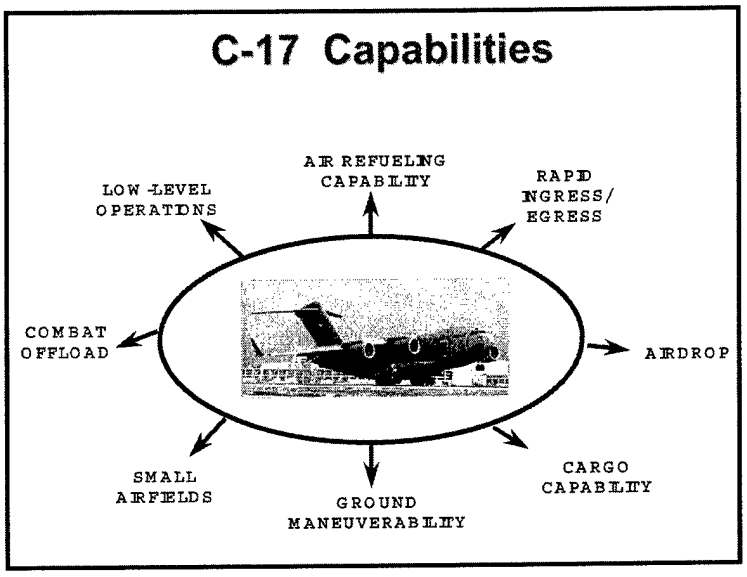


Figure 10 C-17 Capabilities

C-17 Performance

KEY PERFORMANCE PARAMETER	THRESHOLD (minimum)	AIR FORCE OBJECTIVE	CURRENT STATUS
PAYLOAD AT 3200 nm	110,000 lbs	130,000 lbs	131,000 lbs
MAX PAYLOAD LANDING FIELD LENGTH	3,000 ft @ 160K lbs	3,000 ft @ 160K lbs	2,900 ft @ 160K lbs
BACKUP CAPABILITY	1.5% GRADE	2% GRADE	3+% GRADE
TURNING CAPABILITY (ft for 180 degree turn)	90 ft PAVED	96 ft UNPAVED	80 ft PAVED 96 ft UNPAVED
ROLLING STOCK/ OUTSIZE CARGO	15 VEHICLES	15 VEHICLES	15 VEHICLES
AIRDROP	102 PARATROOPS 60,000 lbs	102 PARATROOPS 110,000 lbs	102 PARATROOPS 110,000Lbs

Figure 11 C-17 Performance

military has had a dramatic impact in the way the DoD conducts business with military producing industry. In the 1990s, declining force structure requirements and decreased budgets have translated into a need for smaller purchases of military hardware. This resulting decline has created new challenges for the DoD. The Secretary stressed the Defense Department must work together and more closely with industry to open up the market and find the most efficient and cost effective strategy.[1]

By creating this climate of joint partnership with industry as well as its own working base, the DoD has recently literally reshaped the way it conducts business. With downsizing cuts and a focus by Congress to trim the deficit, there is a new push to refine the acquisition process in the military. The C-17 program helped foster this reevaluation. In his report to the President, Secretary Cohen points out the usual cycle time for a commercial firm to develop and market improved products is three to four years. Currently, the military takes an average of 12 years.[2] Clearly the military can do better. In the case of the C-17 it did not. In short, America needs the C-17. The program is back on track and moving along at a better pace. Problems have occurred, but the C-17 is a quality aircraft. Yes, the Air Force might have paid too much for it due to program mismanagement, *but* they paid too much for an aircraft they needed 15 years ago.

The best soldiers and equipment in the world are of little value if you can't get them to the fight. Lessons were learned on both sides concerning the acquisition process. However, the C-17's efficiency, capability, and performance make it the most capable and versatile airlifter ever. America's heavily tasked soldiers, sailors, and airmen need it...and deserve it.

Notes

[1] William Cohen, *Annual Report To The President And The Congress, April 1997* (Washington, D.C., U.S. Government Printing Office), 112.

[2] Ibid, 114.

Bibliography

Air Mobility Command. C-17 Reliability, Maintainability, and Availability Evaluation. Scott Air Force Base, Ill.: U.S. Government Printing Office, 1990.

Air Mobility Command. The Case for the C-17. Scott Air Force Base, Ill.: U.S. Government Printing Office, 1990.

Arnold, Ronald. Congress and the Bureaucracy--A Theory of Influence. New Haven: Yale University Press, 1979.

Begert, Major General William, USTRANSCOM J3/4. Address. Congress, Washington, D.C., July 1996.

Cohen, William. Annual Report To The President And The Congress, April 1997. Washington, D.C., U.S. Government Printing Office.

Defense Science Board Task Force. C-17 Review. Washington, D.C.: OSD Public Affairs Directorate, 1990.

Druyun, Darlene, principal deputy assistant secretary, acquisition and management, officer of the Secretary of the Air Force. Address. Air Force senior leaders, Washington, D.C., 1996.

Fogleman, General Ronald R., chief of staff, US Air Force. Address. Altus Air Force Base, Ok., 23 March 1996.

General Accounting Office (GAO). C-17 RM & AE Report. Washington, D.C., 1996.

Hogle, General Walter, director of plans and programs, Air Mobility Command. Address. Air Force senior leaders, Washington, D.C., July 1998.

Los Angeles Times, 9 April 1989.

Los Angeles Times, 9 February 1990.

McDonnell Douglas. Airlift for the 21st Century. Long Beach, Ca.: Company Press, 1998

Reuters News Service, 5 March 1995.

Rutherford, General Robert L., commander in chief, USTRANSCOM. Address. House Armed Services Committee, Washington, D.C., February 1996.

Rutherford, General Robert L., commander in chief, USTRANSCOM. Address.
President of the United States, Washington, D.C., January 1995.

St. Louis Post Dispatch, 21 January 1988.

St. Louis Post Dispatch, 20 July 1989.

St. Louis Post Dispatch, 8 June 1990.

St. Louis Post Dispatch, 12 April 1990.

St. Louis Post Dispatch, 8 March 1991.

St. Louis Post Dispatch, 14 September 1991.

St. Louis Post Dispatch, 15 November 1991.

St. Louis Post Dispatch, 1 May 1993.

St. Louis Post Dispatch, 20 August 1993.

St. Louis Post Dispatch, 30 November 1993.

St. Louis Post Dispatch, 30 March 1994.

St. Louis Post Dispatch, 13 October 1994.
St. Louis Post Dispatch, 15 October 1994.
St. Louis Post Dispatch, 11 December 1994.
St. Louis Post Dispatch, 14 May 1995.
St. Louis Post Dispatch, 10 July 1995.
St. Louis Post Dispatch, 6 August 1995.
St. Louis Post Dispatch, 4 November 1995.
"The Air Force and Joint Vision." Joint Force Quarterly, 1994 Winter Addition.
Thompson, Francis. Reinventing The Pentagon: The Political Economy of Post Cold-War Defense. Public Administration Review, 1993.
United States Air Force. Air Mobility Command Master Plan. Washington, D.C.: U.S. Government Printing Office, 1998.
United States Air Force. Reaching Globally, Reaching Powerfully: The United States Air Force in the Gulf War. Washington, D.C.: U.S. Government Printing Office, 1992.
Whicker, Michael. Public Administration Journal. Rutgers University Press, 1997.
Widnall, Sheila, secretary of the Air Force. Address. McDonnell Douglas engineers, Long Beach, Ca., 28 October 1994.
Wright-Patterson Air Force Base. C-17 Combined Test Force: Reliability and Maintainability Test Results. U.S. Government Printing Office, 1994.